

THE

**ENR**  
500

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# Most leading design firms increased

The largest design firms in the U.S. squeezed record billings out of 1970's tight-fisted construction market, according to ENGINEERING NEWS-RECORD's seventh annual survey. Fewer architectural and engineering names made this year's roster than in 1969 because more design-constructors crowded them out.

Two-thirds of the leading designers billed owners for more work in 1970. Several of the largest design firms racked up increases of 100% or more over their 1969 billings. And the 442 leading designers billed \$1.9 billion last year, a substantial increase from 1969's \$1.7 billion garnered by 460 leading design firms.

The maximum billing volume of the leading designers peaked to a new record as two firms billed \$30 million or more in 1970. The minimum billing volume also rose, to over \$1.3 million, up from \$1.2 million a year ago.

Design-constructors did not match the growth of their design-only count-

erparts. More design-constructors made the list this year, 58 compared to 40 firms in 1969, but only one out of three that made the list both years increased their volume.

Top 10 designers shuffled. The 10

leading architectural and engineering firms were well shuffled in 1970. Chas. T. Main, Inc. leads the list for the first time, moving up from its No. 3 slot in 1969 to push Sargent & Lundy back to No. 2.

## The top 58 design constructors and . . .

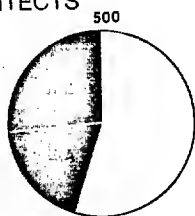
### Construction value of new 1970 contracts

Design-and-construct plus design-only contracts valued at estimated erected cost of project

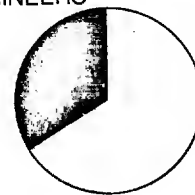
	1970 volume in \$ millions		Construction specialty			
	Total	Foreign	Mfg. plant	Build- ing	Heavy	High- way
1. Boise Cascade Engineering & Const. Group, New York, N.Y.	2,458.3	505.4	+	+	+	..
2. Bechtel Corp., San Francisco, Calif.	1,579.0†	94.0	+	..	+	..
3. The Ralph M. Parsons Co., Los Angeles, Calif.	1,220.9	321.4	+	..	+	..
4. Kaiser Engineers Div., Kaiser Industries, Oakland, Calif.	1,021.2	546.2	+	+	+	+
5. Brown & Root, Inc., Houston, Tex.	978.6	60.1	+	..	+	..
6. The Rust Engineering Co., Pittsburgh, Pa.	756.1	377.8	+	+	+	..
7. Stearns-Roger Corp., Denver, Colo.	756.1	30.6	+	..	+	..
8. Fluor Corp., Los Angeles, Calif.	639.9	301.5	+	+	+	+
9. The Lummus Co., New York, N.Y.	630.0	400.0	+	..	..	..
10. United Engineers & Constructors, Inc., Philadelphia, Pa.	609.0	0	+	..	+	..
11. Arthur McKee & Co., Cleveland, Ohio	593.0	465.0	+	..	..	..
12. Foster Wheeler Corp., Livingston, N.J.	448.0	236.0	+	..	+	..
13. The Austin Co., Cleveland, Ohio	398.3	106.3	+	+	..	..
14. Stone & Webster Engineering Corp., Boston, Mass.	391.1*	n.r.	+	..	..	..
15. Chicago Bridge & Iron Co., Oak Brook, Ill.	391.0	n.r.	+	..	+	..
16. Burns & Roe, Inc., Oradell, N.J.	378.5	25.7	+	+	+	..
17. C. F. Braun & Co., Alhambra, Calif.	368.0	155.0	+	..	+	..
18. The M. W. Kellogg Co., Houston, Tex.	350.0	n.r.	+	..	+	..
19. Catalytic, Inc., Philadelphia, Pa.	289.9	42.9	+	..	..	..
20. Procon, Inc., Des Plaines, Ill.	266.8	212.6	+	..	..	..
21. The Badger Co., Inc., Cambridge, Mass.	226.0†	158.0	+	..	..	..
22. Swindell-Dressler Co., Pittsburgh, Pa.	200.0	n.r.	+	+	+	+
23. The Kujjian Corp., Philadelphia, Pa.	186.0	136.0	+	..	+	..
24. J. Ray McDermott & Co., Inc., New Orleans, La.	160.4	n.r.	+	..	+	..
25. Dravo Corp., Pittsburgh, Pa.	129.3†	85.2	+	..	+	+
26. Daniel International Corp., Greenville, S.C.	124.5	58.6	+	+	+	..
27. Treadwell Corp., New York, N.Y.	a	n.r.	+	..	+	..
28. Day & Zimmermann, Inc., Philadelphia, Pa.	92.6	0	+	+	+	..
29. Sanderson & Porter, Inc., New York, N.Y.	84.5	44.5	+	+	+	..
30. Ragnar Benson, Inc., Chicago, Ill.	80.6	0	+	..	..	..
31. Blaw-Knox Chemical Plants Inc., Pittsburgh, Pa.	80.6	19.3	+	..	..	..
32. Jacobs Engineering Co., Pasadena, Calif.	75.7	0	+	+	..	..
33. Scientific Design Co., Inc., New York, N.Y.	72.0	n.r.	+	..	+	..
34. S.I.P., Inc., Houston, Tex.	67.0	0	+	..	+	..
35. Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.	66.0	0	+	+	+	..
36. Bank Building & Equipment Corp., St. Louis, Mo.	63.2	0	..	+	..	..
37. The H. K. Ferguson Co., Inc., Cleveland, Ohio	60.1	12.8	+	..	..	..
38. Cunningham-Limp Co., Birmingham, Michigan	58.3	7.0	+	+	..	..
39. McDowell-Wetman Engineering Co., Cleveland, Ohio	58.0	21.0	+	..	+	..
40. Centex Corp.-J.W. Bateson Co., Inc., Dallas, Tex.	56.8	14.5	..	+	..	..
41. Townsend and Bottum, Inc., Ann Arbor, Mich.	55.0	0	+	..	+	..
42. J. F. Pritchard & Co., Kansas City, Mo.	53.0	20.0	+	..	..	..
43. Wigton-Abbott Corp., Plainfield, N.J.	50.2	0	+	+	+	..
44. The Hannan Const. Co., Cleveland, Ohio	47.8	0	+	+	..	..
45. Fenix & Scisson, Inc., Tulsa, Okla.	45.2	1.8	..	..	+	..
46. Highland Const. Co., Southfield, Mich.	45.0	0	..	+	..	..
47. Ramada Development Co., Const. Dept., Phoenix, Ariz.	42.2	0	..	+	..	..
48. Crawford & Russell, Inc., Stamford, Conn.	38.5	5.0	+	..	..	..
49. Macdonald Engineering Co., Chicago, Ill.	38.0	0	+	..	..	..
50. Robin Const. Co., Chicago, Ill.	37.7	0	..	+	..	..
51. H. F. Campbell Co., Detroit, Mich.	35.6	0	+	+	+	..
52. The Law Co., Wichita, Kan.	35.0	0	+	+	..	..
53. Monsanto Enviro-Chem Systems, Inc., Chicago, Ill.	33.2	0	+	..	..	..
54. Delta Engineering Corp., Houston, Tex.	31.7	18.1	+	..	..	..
55. Di-Com Corp., Glenview, Ill.	30.3	0	..	+	..	..
56. Jos. L. Muscarelle, Inc., Maywood, N.J.	30.0	0	+	+	..	..
57. Siebert Engineers, Inc., Hinsdale, Ill.	a	n.r.	+	..	..	..
58. Construction Aggregates Corp., Chicago, Ill.	29.0	4.0	+	+	+	..

### More A-E's join The ENR 500

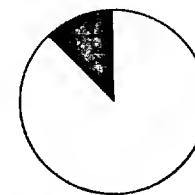
218 ARCHITECTS-ENGINEERS  
and ENGINEERS-ARCHITECTS  
billed \$1.1 billion



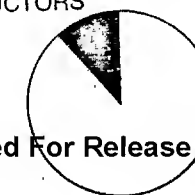
166 CONSULTING ENGINEERS  
billed \$604 million



58 ARCHITECTS billed  
\$165 million



58 DESIGN-CONSTRUCTORS  
won over \$16.5 billion  
in new contracts



## Billings in '70

Michael Baker, Jr., Inc. moved up two notches to No. 3 and Skidmore, Owings & Merrill holds down the No. 4 slot for the second consecutive year.

Two newcomers joined 1970's 10 largest architectural and engineering

firms. Tippetts-Abbett-McCarthy-Stratton (TAMS) is back among the top 10 after a five-year absence. TAMS jumped to No. 5 from the 12th position it held in 1969. And Gibbs & Hill, Inc. slipped into the No. 9 spot.

Howard, Needles, Tammen & Bergendoff slipped down to No. 6 from its No. 2 peg a year ago. Gilbert Assoc., Inc., DeLeuw, Cather & Co., and Louis

Berger, Inc. were slightly shuffled in their rankings to make room for Gibbs & Hill.

**New top design-constructor.** The 58 top design-constructors accounted for over \$16.5 million in 1970 awards. Their total was greatly boosted by Boise Cascade Engineering and Construction Group that broke the \$2-billion mark for the first time in the history of The ENR 500.

The 10 largest design-constructors had few shake-ups in their listing this year. Boise Cascade jumped to the No. 1 slot for the first time. Bechtel Corp. and The Ralph M. Parsons Co. edged back to Nos. 2 and 3 respectively. Kaiser Engineers Division, Brown & Root and The Rust Engineering Co. kept the same positions they occupied in 1969. But Stearns-Roger Corp. leapt from No. 16 to oust The M.W. Kellogg Co. from the No. 7 peg.

Fluor Corp. jumped five slots to No. 8, pushing Arthur McKee & Co. down to No. 10. The Lummus Co. again ranks No. 9 this year.

Twenty design-constructors joined The ENR 500 this year that did not make the roster in 1969.

## ... 442 largest designers in '70

### Billings totaled \$30 million or more

Type of firm #	Buildings	Heavy const.	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
1. Chas. T. Main, Inc., Boston, Mass.	EA	+	+	+	+	+	+	+	+
2. Sargent & Lundy, Chicago, Ill.	E	..	+	+	+	+	+	+	+

### Billings totaled \$25 million to \$29.9 million

3. Michael Baker, Jr., Inc., Rochester, Pa.	(a) EA	+	+	+	+	+	+	+	+
4. Skidmore, Owings & Merrill, Chicago, New York, San Francisco, Portland, Ore. & Washington, D.C.*	AE	+	..	+	+	+	+	+	+

### Billings totaled \$20 million to \$24.9 million

5. Tippetts-Abbett-McCarthy-Stratton, New York, N. Y.	EA	+	+	+	+	+	+	+	+
6. Howard, Needles, Tammen & Bergendoff, Kansas City, Mo. and New York, N. Y.	EAP	+	+	+	+	+	+	+	+
7. Gilbert Assoc., Inc., Reading, Pa.	EA	+	+	+	+	+	+	+	+
8. DeLeuw, Cather & Co., Chicago, Ill.	E	+	+	+	+	+	+	+	+

### Billings totaled \$15 million to \$19.9 million

9. Gibbs & Hill, Inc., New York, N. Y.	EA	+	+	+	+	+	+	+	+
10. Louis Berger, Inc., East Orange, N. J.	EAP	+	+	+	+	+	+	+	+
11. Sverdrup & Parcel and Assoc., Inc., St. Louis, Mo.	EAP	+	+	+	+	+	+	+	+
12. Black & Veatch, Kansas City, Mo.	E	+	+	+	+	+	+	+	+
13. A. Epstein & Sons, Inc., Chicago, Ill.	EA	+	..	+	+	+	+	+	+
14. Frederic R. Harris, Inc., New York, N. Y.	E	+	+	+	+	+	+	+	+
15. Pioneer Service & Engineering Co., Chicago, Ill.	EA	+	+	+	+	+	+	+	+
16. Giffels Assoc., Inc., Detroit, Mich.	AEP	+	+	+	+	+	+	+	+
17. Daniel, Mann, Johnson & Mendenhall, Los Angeles, Calif.	AEP	+	+	+	+	+	+	+	+
18. Commonwealth Assoc., Inc., Jackson, Mich.	EA	+	+	+	+	+	+	+	+

### Billings totaled \$10 million to \$14.9 million

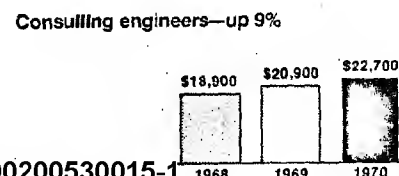
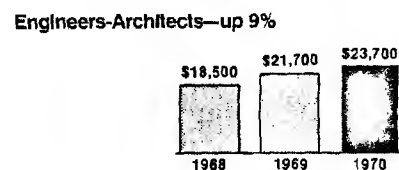
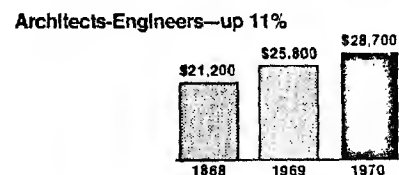
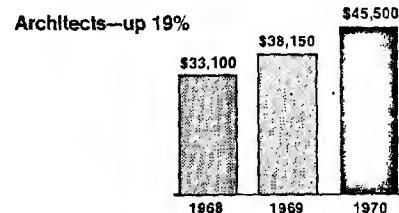
19. Sandwell International, Inc., Portland, Ore.	E	+	+	+	+	+	+	..	+
20. International Engineering Co., Inc., San Francisco, Calif.	E	+	+	+	+	+	+	..	+
21. Henningson, Durham & Richardson, Inc., Omaha, Neb.	EA	+	+	+	+	+	+	+	+
22. Welton Becket & Assoc., Los Angeles, Calif.*	EA	+	..	+	+	+	+	+	+
23. Parsons, Brinckerhoff, Ouade & Douglas, New York, N. Y.	EAP	+	+	+	+	+	+	+	+
24. McIntire & Quiros, Inc., Monterey Park, Calif.	E	..	+	+	+	+	+	..	+
25. Lockwood Greene Engineers, Inc., New York, N. Y.	EA	+	+	+	+	+	+	..	+
26. Metcalf & Eddy, Inc., Boston, Mass.	EAP	+	+	+	+	+	+	+	+
27. Leo A. Daly Co., Omaha, Neb.	AEP	+	+	+	+	+	+	+	+
28. Dames & Moore, Los Angeles, Calif.	ES	+	+	+	+	..	..	..	+
29. Ellerbe Architects/Engineers, St. Paul, Minn.	AE	+	+	+	+	+	+	..	+
30. Wilbur Smith & Assoc., New Haven, Conn.	E	..	+	+	+	+	+	+	+
31. Harza Engineering Co., Chicago, Ill.	E	..	+	+	+	+	+	+	+
32. The Perkins & Will Partnership, Chicago, Ill.	AE	+	..	+	+	+	+	+	+
33. Smith, Hinchman & Grylls Assoc., Inc., Detroit, Mich.	AE	+	+	+	+	+	+	+	+
34. VTN Corp., Irvine, Calif.	(b) EA	+	+	+	+	+	+	+	+
35. The Firm of Dermot Reddy, New York, N. Y.	(c) EA	+	+	+	+	+	+	..	+
36. Woodward-Clyde & Assoc., San Francisco, Calif.	ES	+	+	+	+	..	..	..	+
37. Consoer, Townsend & Assoc., Chicago, Ill.	E	+	+	+	+	+	+	..	+
38. Lockwood, Kessler & Bartlett, Inc., Syosset, N. Y.	E	..	+	+	+	+	+	+	+
39. A. M. Kinney, Inc. & Affiliates, Cincinnati, Ohio.	AE	+	+	+	+	+	+	..	+
40. Gannett, Fleming, Corrdry & Carpenter, Inc., Harrisburg, Pa.	E	+	+	+	+	+	+	+	+
41. Ammann & Whitney, New York, N. Y.*	E	+	+	+	+	+	+	+	+
42. Charles Luckman Assoc., Los Angeles, Calif.	AEP	+	..	+	..	..	..	..	+

a-Includes John Graham & Co. and Carl G. Baker & Assoc. b-Voorhees-Trindle-Nelson, Inc.

c-Formerly Theodore J. Kauffeld

\*Billings estimated by ENR, based on company-reported size of staff #KEY TO TYPE OF FIRM: A=Architect; E=Consulting engineer; AE=Architect-Engineer; EA=Engineer-Architect; S=Soils engineer; P=Planner; Firms classified themselves.

### Average billings per staff jump





Bridge  
Conn. 85—Expressway

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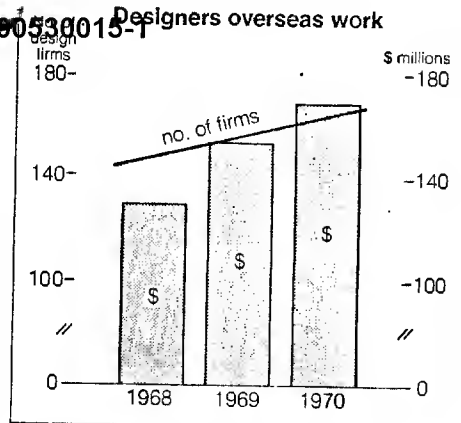
Manufacturing franchises for selected areas are available.

Two out of five work abroad. Two out of five leading design firms reported foreign work for part of their 1970 operations. Billings for work outside the U.S. increased for architectural and engineering firms, but contract awards for design-constructors dipped.

Two out of three of the 58 top design-constructors won contracts in foreign countries in 1970, a smaller percentage than in 1969 when three out of four design-constructors signed up jobs abroad.

More design-constructors joined the ENR 500 this year, but their \$4-billion-plus in contracts for overseas projects failed to match last year's \$4.4 billion foreign total for only 29 firms.

Kaiser Engineers Division again had the highest awards from foreign work, but its \$546.2 million in 1970 fell way below the \$705.6 million it reported a



Designers bill 10% more jobs abroad in '70.

year ago. Boise Cascade Engineering and Construction Group came close to matching Kaiser's foreign total as its awards jumped to \$505.4 million.

Designers bill 10% more. Foreign

continued

## THE ENR 500

Billings totaled \$7.5 million to \$9.9 million

	Type of firm #	Buildings	Heavy const.	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
43. C. F. Murphy Assoc., Chicago, Ill.	AE	+	+	+	+	+	+	+	+	+
44. Reynolds, Smith & Hills, Inc., Jacksonville, Fla.	AEP	+	+	+	+	+	+	+	+	+
45. CH2M/HILL, Corvallis, Ore.	(d) EP	+	+	+	+	+	+	+	+	+
46. J. E. Greiner Co., Inc., Baltimore, Md.	EA	+	+	+	+	+	+	+	+	+
47. Charles A. Maguire & Assoc., Inc., Providence, R. I.	AE	+	+	+	+	+	+	+	+	+
48. Ford Bacon & Davis, New York, Dallas & Monroe, La.	EA	+	+	+	+	+	+	+	+	+
49. Stanley Consultants, Inc., Muscatine, Iowa	EAP	+	+	+	+	+	+	+	+	+
50. Camp, Dresser & McKee, Boston, Mass.	E	+	+	+	+	+	+	+	+	+
51. Lester B. Knight & Assoc., Inc., Chicago, Ill.	AE	+	+	+	+	+	+	+	+	+
52. J. E. Sirrine Co., Greenville, S. C.	EA	+	+	+	+	+	+	+	+	+
53. Vincent G. Kling & Assoc., Philadelphia, Pa.	AE	+	+	+	+	+	+	+	+	+
54. Dalton-Dalton-Little, Cleveland, Ohio	AEP	+	+	+	+	+	+	+	+	+
55. Adrian Wilson Assoc., Los Angeles, Calif.	AEP	+	+	+	+	+	+	+	+	+
56. Sanders & Thomas, Inc., Pottstown, Pa.	EA	+	+	+	+	+	+	+	+	+
57. Wm. Pereira & Assoc., Los Angeles, Calif.	AEP	+	+	+	+	+	+	+	+	+
58. Syska & Hennessy, Inc., New York, N. Y.	E	+	+	+	+	+	+	+	+	+
59. Gruen Assoc., Los Angeles, Calif.	AEP	+	+	+	+	+	+	+	+	+
60. Hellmuth, Obata & Kassabaum, Inc., St. Louis, Mo.	AE	+	+	+	+	+	+	+	+	+
61. Burns & McDonnell Engineering Co., Kansas City, Mo.	EA	+	+	+	+	+	+	+	+	+
62. CRS Design Assoc., Houston, Tex.	(e) AEP	+	+	+	+	+	+	+	+	+

Billings totaled \$5 million to \$7.49 million

63. Benham-Blair & Affiliates, Inc., Oklahoma City, Okla.	AE	+	+	+	+	+	+	+	+	+
64. Green Engineering Co., Sewickley, Pa. and Green Assoc., Inc., Baltimore, Md.	AE	+	+	+	+	+	+	+	+	+
65. Lyon Assoc., Inc., Baltimore, Md.	EA	+	+	+	+	+	+	+	+	+
66. Pipe Line Technologists, Inc., Houston, Tex.	E	+	+	+	+	+	+	+	+	+
67. The Architects Collaborative, Inc., Cambridge, Mass.	AP	+	+	+	+	+	+	+	+	+
68. Edwards & Kelcey, Inc., Newark, N. J.	EA	+	+	+	+	+	+	+	+	+
69. Law Engineering Testing Co., Atlanta, Ga.	ES	+	+	+	+	+	+	+	+	+
70. John Carl Warnecke & Assoc., San Francisco, Calif.	AP	+	+	+	+	+	+	+	+	+
71. Quinton-Budlong, Los Angeles, Calif.	EA	+	+	+	+	+	+	+	+	+
72. Madigan-Praeger, Inc., New York, N. Y.	EA	+	+	+	+	+	+	+	+	+
73. Buchart Assoc. and Buchart-Horn, York, Pa.	AE	+	+	+	+	+	+	+	+	+
74. I. M. Pei & Partners, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
75. Fay, Spofford & Thorndike, Inc., Boston, Mass.	E	+	+	+	+	+	+	+	+	+
76. Whilman-Requardt & Assoc., Baltimore, Md.	EA	+	+	+	+	+	+	+	+	+
77. Albert C. Martin & Assoc., Los Angeles, Calif.	AEP	+	+	+	+	+	+	+	+	+
78. Vollmer Assoc., New York, N. Y.	EA	+	+	+	+	+	+	+	+	+
79. The Eggers Partnership, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
80. Malcolm Pirnie, Inc., White Plains, N. Y.	E	+	+	+	+	+	+	+	+	+

d-Merger of Cornell, Howland, Hayes & Merryfield, Inc. with Clair A. Hill & Assoc. e-Formerly Caudill, Rowlett & Scott

Billings estimated by ENR, based on company-reported size of staff. KEY TO TYPE OF FIRM: A—Architect; AP—Architectural planning; AE—Architect-engineer; EA—Engineer-architect; E—Engineer; ES—Engineer-architect; S—Soils engineer. Firms classified themselves.

billings of the leading architectural and engineering firms jumped 10% to \$170.3 million. Consulting engineers billed the largest portion, \$69.6 million, a 19% increase over a year ago. Engineers-architects billed the second highest sum, whereas they had the largest share of overseas billings in 1969. Architects upped their foreign billings 40% to \$2.1 million while architects-engineers billed 3% less for jobs abroad than in 1969.

While 280 of the leading designers re-

port they do take on work abroad, only 40 out of three (164) billed for foreign projects in 1970. Many of those that did have jobs overseas last year saw their billings drop, especially designers that billed less than \$2.5 million.

Consulting engineers had the best growth record in foreign billings; two had increases for every consultant with a drop in foreign billings. About one-half of the leading architects-engineers and engineers-architects increased their overseas billings. But more architects

continued

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#### Billings totaled \$5 million to \$7.49 million

	Type of firm *	Heavy const.	Buildings	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
81. Harrison & Abramowitz, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
82. Edward Durell Stone & Assoc., New York, N. Y.	A	+	+	+	+	+	+	+	+	+
83. L. Robert Kimball, Ebensburg, Pa.	E	+	+	+	+	+	+	+	+	+
84. Schmidt, Garden & Erikson, Chicago, Ill.	AE	+	+	+	+	+	+	+	+	+
85. McGaughy, Marshall & McMillan, Norfolk, Va.	AE	+	+	+	+	+	+	+	+	+
86. Walk, Haydel & Assoc., Inc., New Orleans, La.	EA	+	+	+	+	+	+	+	+	+
87. Albert Kahn Associated Architects & Engineers, Inc., Detroit, Mich.	AE	+	+	+	+	+	+	+	+	+
88. Haines, Lundberg & Waehler, New York, N. Y.	AE	+	+	+	+	+	+	+	+	+

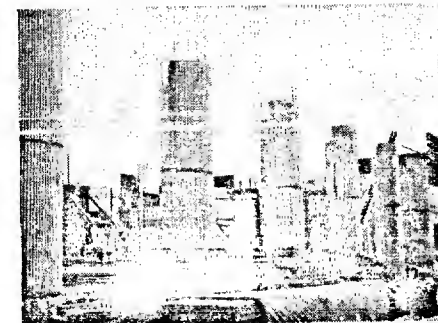
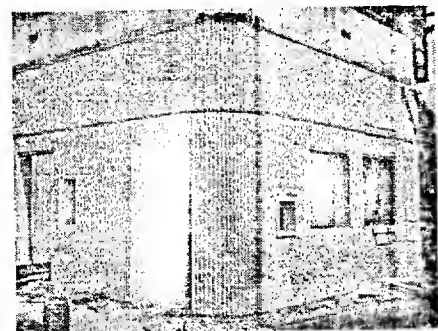
#### Billings totaled \$2.5 million to \$4.9 million

89. Greeley & Hansen, Chicago, Ill.	E	+	+	+	+	+	+	+	+	+
90. O'Brien & Gere Engineers, Inc., Syracuse, N. Y.	E	+	+	+	+	+	+	+	+	+
91. Rogers, Butler & Bergun, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
92. Rogers, Taliatferro, Kostritsky, Lamb/RTKL Inc., Baltimore, Md.	A	+	+	+	+	+	+	+	+	+
93. King & Gavaris Consulting Engineers, Inc., New York, N. Y.	E	+	+	+	+	+	+	+	+	+
94. Simons-Eastern Co., Atlanta, Ga.	(f) EA	+	+	+	+	+	+	+	+	+
95. R. W. Beck & Assoc., Seattle, Wash.	E	+	+	+	+	+	+	+	+	+
96. Lyles, Bissett, Carlisle & Wolff, Columbia, S. C.	AEP	+	+	+	+	+	+	+	+	+
97. Daverman Assoc., Inc., Grand Rapids, Mich.	AE	+	+	+	+	+	+	+	+	+
98. The Pace Co., Houston, Tex.	E	+	+	+	+	+	+	+	+	+
99. Auburn & Assoc., Inc., Pittsburgh, Pa.	E	+	+	+	+	+	+	+	+	+
100. Whitman & Howard, Inc., Boston, Mass.	EA	+	+	+	+	+	+	+	+	+
101. E. Lionel Pavlo, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
102. Roy F. Weston, Inc., West Chester, Pa.	E	+	+	+	+	+	+	+	+	+
103. Naramore, Bain, Brady & Johanson, Seattle, Wash.	AEP	+	+	+	+	+	+	+	+	+
104. Seelye, Stevenson, Value & Knecht, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
105. Huggins, Thompson, Ball & Assoc., Oklahoma City, Okla.	AE	+	+	+	+	+	+	+	+	+
106. Boyle Engineering, Santa Ana, Calif.	EA	+	+	+	+	+	+	+	+	+
107. Skilling, Helle, Christensen, Robertson, Seattle, Wash.	E	+	+	+	+	+	+	+	+	+
108. McFarland-Johnson-Gibbons Engrs., Inc., Binghamton, N. Y.	E	+	+	+	+	+	+	+	+	+
109. Turner, Collier & Braden, Houston, Tex.	E	+	+	+	+	+	+	+	+	+
110. Engineering-Science, Inc., Arcadia, Calif.	E	+	+	+	+	+	+	+	+	+
111. Forrest & Cotton, Inc., Dallas, Tex.	E	+	+	+	+	+	+	+	+	+
112. Wilsey & Ham, San Mateo, Calif.	EA	+	+	+	+	+	+	+	+	+
113. C-S-T Engineering Co., Los Angeles, Calif.	EA	+	+	+	+	+	+	+	+	+
114. Norman Engineering, Los Angeles, Calif.	EA	+	+	+	+	+	+	+	+	+
115. Rader & Assoc., Miami, Fla.	EA	+	+	+	+	+	+	+	+	+
116. Goodkind & O'Dea, Inc., Montclair, N. J.	ES	+	+	+	+	+	+	+	+	+
117. Burke, Kober, Nicolais & Archuleta, Los Angeles, Calif.	AE	+	+	+	+	+	+	+	+	+
118. Stone, Marracini & Patterson, San Francisco, Calif.	A	+	+	+	+	+	+	+	+	+
119. Maxwell Starkman & Assoc., Beverly Hills, Calif.	A	+	+	+	+	+	+	+	+	+
120. Connell, Pierce, Garland & Friedman, & Connell Assoc., Inc., Miami, Fla.	AEP	+	+	+	+	+	+	+	+	+
121. Rummel, Klepper & Kahl, Baltimore, Md.	E	+	+	+	+	+	+	+	+	+
122. Murray & McCormick, Inc., Sacramento, Calif.	E	+	+	+	+	+	+	+	+	+
123. Anderson-Nichols & Co., Inc., Boston, Mass.	EA	+	+	+	+	+	+	+	+	+
124. Cahn Engineers, Inc., New Haven, Conn. & Newman & Doll, White Plains, N. Y.	E	+	+	+	+	+	+	+	+	+
125. Erdman & Anthony, Rochester, N. Y. & Camp Hill, Pa.	E	+	+	+	+	+	+	+	+	+
126. Alan M. Voorhees & Assoc., Inc., McLean, Va.	E	+	+	+	+	+	+	+	+	+
127. Kahn & Jacobs, New York, N. Y.	A	+	+	+	+	+	+	+	+	+

\*Formerly Eastern Engineering Co.

Billings estimated by ENR based on company reports.  
E - Consulting engineer; AE - Architect-Engineer; EA - Engineer-Architect; S - Soils engineer. Firms classified themselves.

## ARCHITECTURAL CONCRETE WITH RIBBED LINER



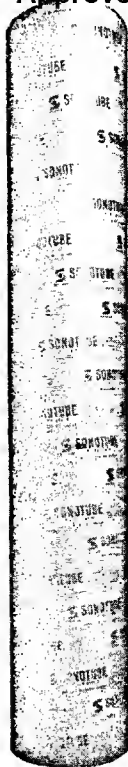
The Calumet Construction Co., Hammond, Ind., used Symons Steel-Ply Forms with Symons 1½" Deep Rib Plastic Liner for all bearing walls and columns on the First National Bank of Lansing, Ill. The liners were handset for each re-use.

These deep, architecturally dramatic ribs can be easily cast into any concrete surface. As the sun revolves through the day, distinctive shadows appear within the ribs, giving the concrete surface strong, clean lines. Several different finishes are possible with this liner. Concrete can be left smooth, sandblasted or roughened by hammer blows and bush hammering. The rough finish shown was obtained by bush hammering. Liner life is high and not affected by the number of concrete casts.

Symons architectural form liner brochure is available upon request.

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billed less work abroad, than increase in last year. Europe still attracts the most leading architectural and engineering firms. Currently, 120 jobs keep leading firms busy in 19 European countries with France leading the tally. South America is the second most popular continent, followed by Asia. The leading designers are also active in 26 African nations. For a single country, Canada has the most attraction. Thirty-three of the leading design firms are working there now. Brazil is second with 26 designers. Average billings up 13.5%. Two out of three leading designers in 1970 billed owners for more work than in 1969.

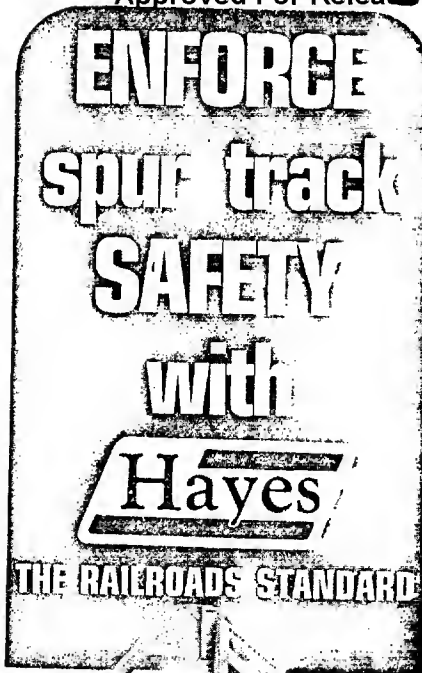
### continued **THE** **ENR** 500

#### Billings totaled \$2.5 million to \$4.9 million

	Type of firm *	Heavy const.	Buildings	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
128. Bovay Engineers, Inc., Houston, Tex.	E	+	+	+	+	+	+	+	+	+
129. Meyer, Strong & Jones, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
130. Tudor Engineering Co., San Francisco, Calif.	E	+	+	+	+	+	+	+	+	+
131. Porter and Ripa Assoc., Inc., Newark, N. J.	EASP	+	+	+	+	+	+	+	+	+
132. Bellante, Clauss, Miller & Nolan, Inc., Scranton, Pa.	AEP	+	+	+	+	+	+	+	+	+
133. Engineering Consultants, Inc., Denver, Colo.	E	+	+	+	+	+	+	+	+	+
134. Max O. Urbahn Assoc., Inc., New York, N. Y.	AP	+	+	+	+	+	+	+	+	+
135. Harry Weese & Assoc., Chicago, Ill.	A	+	+	+	+	+	+	+	+	+
136. Robert & Co. Assoc., Atlanta, Ga.	AE	+	+	+	+	+	+	+	+	+
137. Sargent-Webster-Crenshaw & Folley, Syracuse, N. Y.	AE	+	+	+	+	+	+	+	+	+
138. Soil Testing Services, Inc., Northbrook, Ill.	S	+	+	+	+	+	+	+	+	+
139. Hanford Engineering Services Div., Vitro Corp. of America, Richland, Wash.	AE	+	+	+	+	+	+	+	+	+
140. Barton-Aschman Assoc., Inc., Chicago, Ill.	EP	+	+	+	+	+	+	+	+	+
141. Matz, Childs & Assoc., Baltimore, Md.	EA	+	+	+	+	+	+	+	+	+
142. Rose, Beaton and Rose, White Plains, N. Y.	AE	+	+	+	+	+	+	+	+	+
143. MacKay & Samps, San Jose, Calif.	E	+	+	+	+	+	+	+	+	+
144. Ewing Cole Erdman & Eubank, Philadelphia, Pa.	AEP	+	+	+	+	+	+	+	+	+
145. Severud-Perrone-Sturm-Bandel, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
146. The Grad Partnership, Newark, N. J.	(g) AEP	+	+	+	+	+	+	+	+	+
147. Ritchie Assoc., Inc., Chestnut Hill, Mass.	A	+	+	+	+	+	+	+	+	+
148. Chas. W. Cole & Son, Inc., South Bend, Ind.	EA	+	+	+	+	+	+	+	+	+
149. James M. Montgomery, Consulting Engineer, Inc. Pasadena, Calif.	E	+	+	+	+	+	+	+	+	+
150. Chance Enterprises, Inc., East Detroit, Mich.	AE	+	+	+	+	+	+	+	+	+
151. Dewberry, Nealon & Davis, Fairfax, Va.	EA	+	+	+	+	+	+	+	+	+
152. Harland Bartholomew & Assoc., Memphis, Tenn.	E	+	+	+	+	+	+	+	+	+
153. Peter F. Loftus Corp., Pittsburgh, Pa.	E	+	+	+	+	+	+	+	+	+
154. McClelland Engineers, Inc., Houston, Tex.	S	+	+	+	+	+	+	+	+	+
155. The Cannon Partnership, Niagara Falls, N. Y.	AE	+	+	+	+	+	+	+	+	+
156. George S. Nolte Consulting Civil Engineers, Inc., San Jose, Calif.	EP	+	+	+	+	+	+	+	+	+
157. Curtis & Davis, New Orleans, La. & New York, N. Y.	A	+	+	+	+	+	+	+	+	+
158. Minoru Yamasaki & Assoc., Troy, Mich.	AE	+	+	+	+	+	+	+	+	+
159. Engineers Inc., Newark, N. J.	EA	+	+	+	+	+	+	+	+	+
160. Fenlon G. Keyes Assoc., Providence, R. I.	AE	+	+	+	+	+	+	+	+	+
161. Hayes, Seay, Mattern & Mattern, Roanoke, Va.	AE	+	+	+	+	+	+	+	+	+
162. Harley Ellington-Pierce, Wolf, Yee & Assoc., Southfield, Mich.	AE	+	+	+	+	+	+	+	+	+
163. Joseph R. Loring & Assoc., Inc., New York, N. Y.	E	+	+	+	+	+	+	+	+	+
164. Johnson & Anderson, Inc., Pontiac, Mich.	E	+	+	+	+	+	+	+	+	+
165. Davis Brody & Assoc., New York, N. Y.	A	+	+	+	+	+	+	+	+	+
166. Williams & Works, Grand Rapids, Mich.	E	+	+	+	+	+	+	+	+	+
167. Langdon & Wilson, Los Angeles, Calif.	A	+	+	+	+	+	+	+	+	+
168. The Ken R. White Co., Denver, Colo.	EA	+	+	+	+	+	+	+	+	+
169. Wilson & Co., Salina, Kan.	EA	+	+	+	+	+	+	+	+	+
170. Samborn, Sietek, Otis & Evans, Inc., Toledo, Ohio.	EAP	+	+	+	+	+	+	+	+	+
171. Brevard Engineering-Stottler, Stagg & Assoc., Cape Canaveral, Fla.	EAP	+	+	+	+	+	+	+	+	+
172. Blauvelt Engineering Co., New York, N. Y.	E	+	+	+	+	+	+	+	+	+
173. Gruzen & Partners, New York, N. Y.	AEP	+	+	+	+	+	+	+	+	+
174. Hubbell, Roth & Clark, Inc., Bloomfield Hills, Mich.	E	+	+	+	+	+	+	+	+	+
175. Office of Alfred Easlon Poor, New York, N. Y.	AE	+	+	+	+	+	+	+	+	+
176. Alden E. Shison & Assoc., Columbus, Ohio.	E	+	+	+	+	+	+	+	+	+
177. Ferrenz & Taylor, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
178. Brown & Caldwell, San Francisco, Calif.	E	+	+	+	+	+	+	+	+	+
179. The Chester Engineers, Inc., Coraopolis, Pa.	E	+	+	+	+	+	+	+	+	+
180. LeMessurier Assoc., Inc., Cambridge, Mass.	E	+	+	+	+	+	+	+	+	+
181. Lockwood, Andrews & Newnam, Inc., Houston, Tex.	E	+	+	+	+	+	+	+	+	+
182. Holabird & Root, Chicago, Ill.	AE	+	+	+	+	+	+	+	+	+

g-Formerly Frank Grad & Sons

Billings estimated by ENR, based on company-reported size of staff. KEY TO TYPE OF FIRM: A = Architect; E = Engineering; EA = Architect-Engineer; AE = Engineer-Architect; S = Soils engineer. Firms classified themselves.

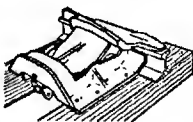


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The increase stems from both high construction costs and the complexity of projects that require total environmental and sociological planning. These factors offset the impact of fewer new construction starts in 1970 than in 1969, so that only one out of three leading designers saw their billings squeezed by last year's tight money conditions.

But those firms with higher billings raised the average billings for all lead-

ing design firms by 13.5% to \$4.2 million. This sustained a good average rate of growth that saw average billings per firm climb 13.1% in 1969.

Consulting engineers fared the best in 1970 of any type of design organization. Four out of five consultants billed owners for more work last year than in 1969. Architects had the second best record; three out of four increased their billings last year. For architects-engineers and engineers-architects, two

## continued THE ENR 500

Billings totaled \$2.5 million to \$4.9 million

	Type of firm #	Heavy const.	Buildings	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
183. Kiff, Voss & Franklin, Office of York & Sawyer, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
184. Edward L. Barnes, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
185. Dreyfuss & Blackford, Sacramento, Calif.	A	+	+	+	+	+	+	+	+	+
186. Westmoreland Engineering Co., Inc., Monessen, Pa.	E	+	+	+	+	+	+	+	+	+
187. Neuhaus & Taylor, Houston, Tex.	A	+	+	+	+	+	+	+	+	+
188. Singmaster & Breyer, New York, N. Y.	EA	+	+	+	+	+	+	+	+	+
189. Abbott-Merkel & Co., New York, N. Y.	AE	+	+	+	+	+	+	+	+	+
190. Watson & Co., Tampa, Fla.	EA	+	+	+	+	+	+	+	+	+
191. Francis Assoc., Inc., Marion, Mass.	E	+	+	+	+	+	+	+	+	+
192. Frankfurt-Short-Emery-McKinley, Oklahoma City & New York	AE	+	+	+	+	+	+	+	+	+
193. Airways Engineering Corp., Washington, D. C.	EA	+	+	+	+	+	+	+	+	+
194. Southern Engineering Co. of Ga., Atlanta, Ga.	EA	+	+	+	+	+	+	+	+	+
195. Burgess & Niple, Ltd., Columbus, Ohio	E	+	+	+	+	+	+	+	+	+
196. Soros Assoc., New York, N. Y.	E	+	+	+	+	+	+	+	+	+
197. Richardson, Gordon & Assoc., Pittsburgh, Pa.	E	+	+	+	+	+	+	+	+	+
198. Hazelet & Erdal, Louisville, Ky.	E	+	+	+	+	+	+	+	+	+
199. Wilson, Morris, Crain & Anderson, Houston, Tex.	A	+	+	+	+	+	+	+	+	+
200. Mueser, Rutledge, Wentworth & Johnston, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
201. Flynn, Dalton, van Dijk & Partners, Cleveland, Ohio	A	+	+	+	+	+	+	+	+	+
202. Everett I. Brown Co., Indianapolis, Ind.	AE	+	+	+	+	+	+	+	+	+
203. Herman Blum Consulting Engineers, Inc., Dallas, Tex.	E	+	+	+	+	+	+	+	+	+
204. Campbell, Aldrich & Nulty, Boston, Mass.	A	+	+	+	+	+	+	+	+	+
205. Clarke & Rapuano, Inc., New York, N. Y.	AE	+	+	+	+	+	+	+	+	+
206. Trico International, Scottsdale, Ariz.	E	+	+	+	+	+	+	+	+	+
207. John J. Kassner & Co., Inc., New York, N. Y.	EA	+	+	+	+	+	+	+	+	+
208. Mason & Hanger-Silas Mason Co., Inc., New York, N. Y.	EA	+	+	+	+	+	+	+	+	+
209. Bernard Johnson Engineers, Inc., Houston, Tex.	EA	+	+	+	+	+	+	+	+	+
210. Havens & Emerson, Ltd., Cleveland, Ohio	E	+	+	+	+	+	+	+	+	+
211. George M. Ewing Co., Philadelphia, Pa.	AE	+	+	+	+	+	+	+	+	+
212. Palmer & Baker Engineers, Inc., Mobile, Ala.	ES	+	+	+	+	+	+	+	+	+
213. Hazen & Sawyer, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
214. Hoag-Wismar-Henderson Assoc. & H. W. H. Assoc. Inc., Cleveland, Ohio	AE	+	+	+	+	+	+	+	+	+
215. Campbell, Rea, Hayes & Large, Altoona, Pa.	A	+	+	+	+	+	+	+	+	+
216. Ferendino/Grafton/Pancoast, Coral Gables, Fla.	AE	+	+	+	+	+	+	+	+	+
217. Toltz King Duval Anderson & Assoc., St. Paul, Minn.	EA	+	+	+	+	+	+	+	+	+
218. Alfred Benesch & Co., Chicago, Ill.	E	+	+	+	+	+	+	+	+	+
219. Shepley, Bulfinch, Richardson & Abbott, Boston, Mass.	A	+	+	+	+	+	+	+	+	+
220. Post, Buckley, Schuh & Jernigan, Inc., Hialeah, Fla.	E	+	+	+	+	+	+	+	+	+
221. Pacific Architects & Engineers, Los Angeles, Calif.	EA	+	+	+	+	+	+	+	+	+
222. Candeb, Fleissig & Assoc., Newark, N. J.	P	+	+	+	+	+	+	+	+	+
223. Wiley & Wilson, Lynchburg, Va.	EA	+	+	+	+	+	+	+	+	+
224. Knoerle Bender Stone & Assoc., Inc., Baltimore, Md.	E	+	+	+	+	+	+	+	+	+
225. August Perez, Jr., & Assoc., New Orleans, La.	AE	+	+	+	+	+	+	+	+	+
226. J. N. Pease & Assoc., Charlotte, N. C.	AE	+	+	+	+	+	+	+	+	+
227. Clarkson & Clough Assoc., Albany, N. Y.	E	+	+	+	+	+	+	+	+	+
228. E. S. Preston Assoc., Inc., Columbus, Ohio	E	+	+	+	+	+	+	+	+	+
229. Koebig & Koebig, Inc., Los Angeles, Calif.	EA	+	+	+	+	+	+	+	+	+
230. Pope, Evans & Robbins, New York, N. Y.	EA	+	+	+	+	+	+	+	+	+
231. The Cerny Assoc., Inc., Minneapolis, Minn.	A	+	+	+	+	+	+	+	+	+
232. Marshall & Brown, Inc., Kansas City, Mo.	AE	+	+	+	+	+	+	+	+	+
233. John Portman & Assoc., Atlanta, Ga.	AE	+	+	+	+	+	+	+	+	+
234. Lev Zetlin Assoc., Inc., New York, N. Y.	E	+	+	+	+	+	+	+	+	+
235. Charles H. McCauley & Assoc., Birmingham, Ala.	A	+	+	+	+	+	+	+	+	+
236. Marcel Breuer, New York, N. Y.	A	+	+	+	+	+	+	+	+	+

Billings estimated by ENR based on 1970 data. KEY TO TYPE OF FIRM: A - Architect; E - Consulting engineer; AE - Architect-engineer; EA - Engineer-architect; S - Soils engineer. Firms classified themselves.



firms billed more work for every firm with a drop in billings over \$5 million reduced staff in

Approved For Release 2002/02/06 : CIA-RDP86-00244R000200530015-1

**Many cut staffs.** Almost half of the leading design firms have smaller design staffs now than a year ago, based on company reported figures including professionals and technicians, but excluding all clerical and accounting personnel.

Staff reductions were most prevalent among design firms doing less than \$5 million in annual billings. Yet nearly one-half of the designers with 1970

Architects' staffs suffered the most widespread reductions, with more architectural firms reducing staff than increasing it. Architects-engineers followed close behind with one firm cutting back for each firm that showed an increase. Consulting engineers and engineers-architects were more moderate with staff reductions and only about 40% of them reported cut-backs during the past 12 months.

continued

## THE ENR 500

Billings totaled over \$1.3 million up to \$2.49 million

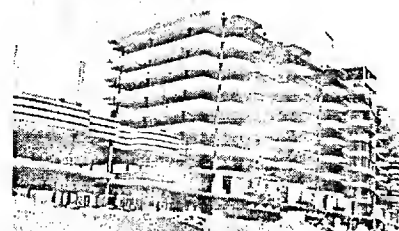
	Type of firm #	Buildings	Heavy const.	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
237. Stevens, Thompson & Runyan, Inc., Portland, Ore.....	EP	+	+	+	+	+	+	+	+	..
238. H. W. Lockner, Inc., Chicago, Ill.....	E	..	+	+	+	+	+	+	+	..
239. Clyde E. Williams Assoc., Inc., South Bend, Ind.....	EP	..	+	+	+	+	+	+	+	..
240. TEL Consulting Engineers, Inc. and Eshbach Pullinger Stevens & Bruder, Philadelphia, Pa.....	EA	+	+	+	+	+	+	+	+	..
241. Van Houten Assoc., Inc., New York, N. Y.....	E	+	+	+	+	+	+	+	+	..
242. Ellis Naeyaert Assoc., Inc., Warren, Mich.....	AE	+	+	+	+	+	+	+	+	..
243. The Balfinger Company, Philadelphia, Pa.....	AE	+	+	+	+	+	+	+	+	..
244. Clark, Dietz & Assoc., Urbana, Ill.....	EA	+	+	+	+	+	+	+	+	..
245. Elson T. Killam Assoc., Inc., Millburn, N. J.....	E	..	+	+	+	+	+	+	+	..
246. Perry Dean & Stewart, Boston, Mass.....	A	+	+	+	+	+	+	+	+	..
247. Laramore, Douglass & Popham, New York, N. Y.....	E	+	+	+	+	+	+	+	+	..
248. Rochlin & Baran, Los Angeles, Calif.....	AE	+	+	+	+	+	+	+	+	..
249. Hale & Kullgren, Akron, Ohio.....	EA	+	+	+	+	+	+	+	+	..
250. Greenhorne & O'Mara, Inc., Riverdale, Md.....	EA	+	+	+	+	+	+	+	+	..
251. R. W. Booker & Assoc., Inc., St. Louis, Mo.....	EAP	+	+	+	+	+	+	+	+	..
252. Wheeler & Gray, Los Angeles, Calif.....	E	+	+	+	+	+	+	+	+	..
253. Beiling Engineering Consultants, Moline, Ill.....	E	+	+	+	+	+	+	+	+	..
254. Harbeson, Hough, Livingston & Larson, Philadelphia, Pa.....	A	+	+	+	+	+	+	+	+	..
255. Erkel, Greenfield & Assoc., Los Angeles, Calif.....	E	+	+	+	+	+	+	+	+	..
256. Hoskins-Western-Sonderegger, Inc., Lincoln, Neb.....	(h)EA	+	+	+	+	+	+	+	+	..
257. Conrad Assoc., Van Nuys, Calif.....	AE	+	+	+	+	+	+	+	+	..
258. P. & W. Engineers, Inc., Chicago, Ill.....	E	+	+	+	+	+	+	+	+	..
259. James Assoc., Inc., Indianapolis, Ind.....	AE	+	+	+	+	+	+	+	+	..
260. Meridian Engineering, Philadelphia, Pa.....	EA	+	+	+	+	+	+	+	+	..
261. Black, Crow & Eidsness, Inc., Gainesville, Fla.....	E	+	+	+	+	+	+	+	+	..
262. Shaver & Co., Salina, Kan.....	A	+	+	+	+	+	+	+	+	..
263. Drumme, Rosane, Anderson, Newton Lower Falls, Mass.....	A	+	+	+	+	+	+	+	+	..
264. Freese, Nichols & Endress, Fort Worth, Tex.....	E	+	+	+	+	+	+	+	+	..
265. Heery & Heery, Inc., Atlanta, Ga.....	AE	+	+	+	+	+	+	+	+	..
266. Hugh Stubbins Assoc., Cambridge, Mass.*.....	A	+	+	+	+	+	+	+	+	..
267. Earl & Wright, San Francisco, Calif.....	E	+	+	+	+	+	+	+	+	..
268. John G. Hoad & Assoc., Ypsilanti, Mich.....	EA	+	+	+	+	+	+	+	+	..
269. R. M. Towill Corp., Honolulu, Hawaii.....	E	+	+	+	+	+	+	+	+	..
270. Frederic P. Wiedersum & Assoc., Valley Stream, N. Y.....	AE	+	+	+	+	+	+	+	+	..
271. Kirkham, Michael & Assoc., Omaha, Neb.....	EA	+	+	+	+	+	+	+	+	..
272. Finley Engineering Co., Lamar, Mo.....	E	+	+	+	+	+	+	+	+	..
273. Shannon & Wilson, Inc., Seattle, Wash.....	ES	+	+	+	+	+	+	+	+	..
274. Charles J. Kupper, Inc., Piscataway, N. J.....	E	+	+	+	+	+	+	+	+	..
275. Odell Assoc., Inc., Charlotte, N. C.....	AEP	+	+	+	+	+	+	+	+	..
276. E. D'Appolonia Consulting Engineers, Pittsburgh, Pa.....	ES	+	+	+	+	+	+	+	+	..
277. Alfred Panepinto, Philadelphia, Pa.....	A	+	+	+	+	+	+	+	+	..
278. Clinton Bogert Assoc., Fort Lee, N. J.....	E	+	+	+	+	+	+	+	+	..
279. W. A. DiGiacomo Assoc., New York, N. Y.....	E	+	+	+	+	+	+	+	+	..
280. Michigan Testing Engineers Inc., Detroit, Mich.....	ES	+	+	+	+	+	+	+	+	..
281. Hill, Ingman, Chase & Co., Seattle, Wash.....	E	+	+	+	+	+	+	+	+	..
282. Harding, Miller, Lawson & Assoc., San Francisco, Calif.....	S	+	+	+	+	+	+	+	+	..
283. Touns Engineering Inc., Santa Ana, Calif.....	E	+	+	+	+	+	+	+	+	..
284. Patchen, Mingledorff & Assoc., Augusta, Ga.....	EA	+	+	+	+	+	+	+	+	..
285. Watkins & Assoc., Inc., Lexington, Ky.....	AE	+	+	+	+	+	+	+	+	..
286. Harrell & Hamilton, Dallas, Tex.....	AEP	+	+	+	+	+	+	+	+	..
287. Warren & Van Praag, Inc., Decatur, Ill.....	EA	+	+	+	+	+	+	+	+	..
288. TEVCO, Inc., Sacramento, Calif.....	EA	+	+	+	+	+	+	+	+	..

h-Formerly Harold Hoskins & Assoc. Inc.

Billings estimated by ENR. Approved For Release 2002/02/06 : CIA-RDP86-00244R000200530015-1  
E = Consulting engineer; AE = Architect-Engineer; EA = Engineer-Architect; S = Soils engineer. Firms classified themselves.

# LIFT SLAB BUILDING SYSTEMS

with Prescon  
post-tensioning



First stage at left — at right final position of prestressed slabs. Concrete placement, tendon and rebar installation, and tensioning are all done at ground level.

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The owner-builder realized all the labor and cost saving advantages of Systems Building without capital investment in a System. Constructed on schedule despite a strike and winter weather, architectural expression was achieved without the restrictions normally associated with Systems Building.

### ADVANTAGES:

- Faster construction;
- More economical;
- Eliminates 90% of forming;
- Minimum labor requirements;
- Added flexibility;
- Quality construction and concrete finish;
- Proven concept;
- Experienced technical assistance;
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- No "Systems" investment required;
- High rise construction — 20 floors or more;
- Year around construction;
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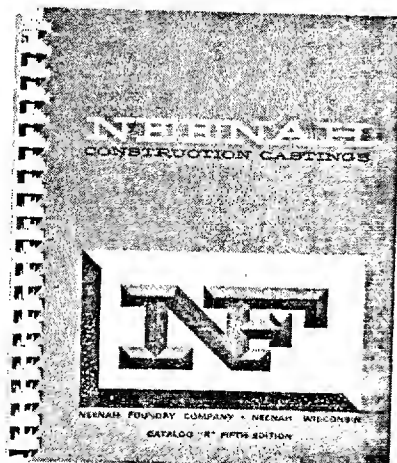
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Despite recent staff reductions, the ratio of professional staff to total staff remains at 50% for every type of design organization.

Average 1970 billings per staff member increased across the board. But increases are exaggerated because billings are for 1970 while staff size is current, so that widespread staff reductions are not fairly reflected in billings.

For architects, the average billings per staff member rose 19% to \$45,456. Architects-engineers saw their average billings to staff ratio leap 11% and consulting engineers and engineers-architects paced a 9% jump over a year ago.

Soils engineers billed an average of \$30,000 per staff member, up 8% from 1969.

**More city planners.** More than half the leading designers do city or regional planning, a slight increase from 1969. Transportation planning is done by more than one out of three design firms. Each year the popularity of these types of planning along with pollution control and mass transit studies grows among The ENR 500. While environmental and sociological planning is a relatively new dimension in the design field, it is fast becoming an indispensable aspect.

continued  
**THE ENR 500**

Billings totaled over \$1.3 million up to \$2.49 million

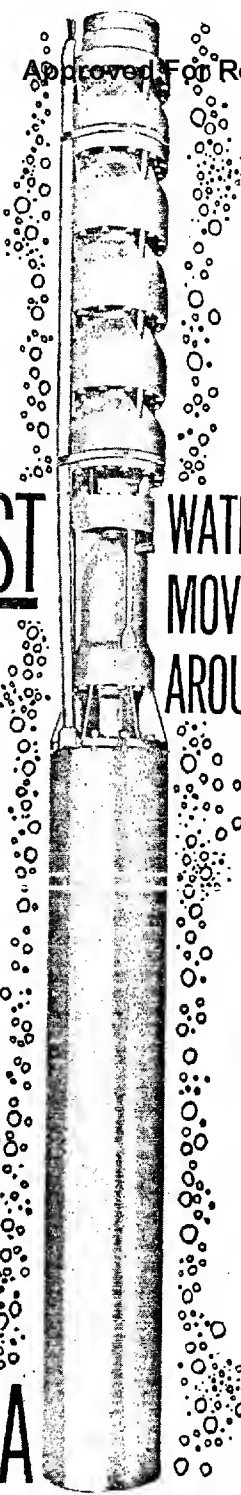
	Type of firm #	Buildings	Heavy const.	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
289. Graham, Anderson, Probst & White, Chicago, Ill.	AE	+	+	+	+	+	+	+	+	+
290. Harry O. Heltzer Assoc., Inc., Chicago, Ill.	E	+	+	+	+	+	+	+	+	+
291. Biernacki-Poray & Assoc., Montclair, N. J.	AE	+	+	+	+	+	+	+	+	+
292. Boswell Engineering Co., Ridgefield Park, N. J.	E	+	+	+	+	+	+	+	+	+
293. John A. Blume & Assoc., San Francisco, Calif.	EA	+	+	+	+	+	+	+	+	+
294. Tryck, Nyman & Hayes, Anchorage, Alaska	E	+	+	+	+	+	+	+	+	+
295. McCreary-Koretsky International, Inc., San Francisco, Calif.	E	+	+	+	+	+	+	+	+	+
296. Algeier, Martin & Assoc., Joplin, Mo.	EA	+	+	+	+	+	+	+	+	+
297. Nelson, Haley, Patterson & Quirk, Greeley, Colo.	EA	+	+	+	+	+	+	+	+	+
298. David Volkert & Assoc., Washington, D. C.	E	+	+	+	+	+	+	+	+	+
299. Anson-Grove-Haack & Assoc., Fort Lauderdale, Fla.	AE	+	+	+	+	+	+	+	+	+
300. William W. Bond, Jr. & Assoc., Memphis, Tenn.	AE	+	+	+	+	+	+	+	+	+
301. Loebl, Schlossman, Bennett & Dart, Chicago, Ill.	AE	+	+	+	+	+	+	+	+	+
302. Leroy Crandall & Assoc., Los Angeles, Calif.	S	+	+	+	+	+	+	+	+	+
303. Ralph L. Woolpert Co., Dayton, Ohio	E	+	+	+	+	+	+	+	+	+
304. Hensley-Schmidt, Inc., Chattanooga, Tenn.	E	+	+	+	+	+	+	+	+	+
305. John G. Reutter Assoc., Camden, N. J.	E	+	+	+	+	+	+	+	+	+
306. Buck-Seifert & Jost, Englewood Cliffs, N. J.	E	+	+	+	+	+	+	+	+	+
307. William B. Tabler, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
308. Globe Engineering Co., Chicago, Ill.	EA	+	+	+	+	+	+	+	+	+
309. A. A. Mathews, Inc., Arcadia, Calif.	E	+	+	+	+	+	+	+	+	+
310. The Richardson Assoc., Seattle, Wash.	AE	+	+	+	+	+	+	+	+	+
311. Eilers & Reaves, Memphis, Tenn.	E	+	+	+	+	+	+	+	+	+
312. Metz, Train, Olson & Youngren, Inc., Chicago, Ill.	AE	+	+	+	+	+	+	+	+	+
313. R. M. Galloway & Assoc., Inc., Newport Beach, Calif.	E	+	+	+	+	+	+	+	+	+
314. Modjeski & Masters, Harrisburg, Pa.	E	+	+	+	+	+	+	+	+	+
315. Fletcher-Thompson, Inc., Bridgeport, Conn.	AE	+	+	+	+	+	+	+	+	+
316. Joseph S. Ward, Inc., Caldwell, N. J.	S	+	+	+	+	+	+	+	+	+
317. Arbogast, Jones, Theiss Assoc., Los Angeles, Calif.	AE	+	+	+	+	+	+	+	+	+
318. Carter & Burgess, Inc., Fort Worth, Tex.	EP	+	+	+	+	+	+	+	+	+
319. Gribaldo, Jones & Assoc., San Francisco, Calif.	S	+	+	+	+	+	+	+	+	+
320. Capacete-Martin & Assoc., San Juan, Puerto Rico	AE	+	+	+	+	+	+	+	+	+
321. Betz Environmental Engineers, Inc., Plymouth Meeting, Pa.	(I) E	+	+	+	+	+	+	+	+	+
322. M W Inc., Indianapolis, Ind.	AE	+	+	+	+	+	+	+	+	+
323. Jones & Henry Engineers, Ltd., Toledo, Ohio	E	+	+	+	+	+	+	+	+	+
324. Moore, Gardner & Assoc., Greensboro, N. C.	E	+	+	+	+	+	+	+	+	+
325. Singstad, Kehart, November & Hurka, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
326. Raymond & Rado and Partners, New York, N. Y.	AE	+	+	+	+	+	+	+	+	+
327. Vogt Ivers & Assoc., Inc., Cincinnati, Ohio	EA	+	+	+	+	+	+	+	+	+
328. Van Doren-Hazard-Stallings-Schnacke, Topeka, Kan.	EA	+	+	+	+	+	+	+	+	+
329. Mills, Petticord & Mills, Washington, D. C.	AE	+	+	+	+	+	+	+	+	+
330. DiStasio & Van Buren, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
331. Bothwell, Jenkins, Slay & Assoc., Decatur, Ga.	A	+	+	+	+	+	+	+	+	+
332. Floyd G. Browne & Assoc., Ltd., Marion, Ohio	E	+	+	+	+	+	+	+	+	+
333. Desmond & Lord, Boston, Mass.	A	+	+	+	+	+	+	+	+	+
334. John J. Flad & Assoc., Madison, Wis.	AE	+	+	+	+	+	+	+	+	+
335. Wiedeman & Singleton, Atlanta, Ga.	E	+	+	+	+	+	+	+	+	+
336. Frank L. Hope & Assoc., San Diego, Calif.	AE	+	+	+	+	+	+	+	+	+

I-Formerly Albright & Friel, and Fridy, Gauker & Fridy

Billings estimated by ENR, based on company-reported size of staff. KEY TO TYPE OF FIRM: A=Architect; AE=Architect-engineer; E=Engineer; EA=Engineer-architect; S=Soils engineer. Firms classified themselves.



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The 442 leading design firms also report they are involved in aerial photography, computer design and systems building and engineering.

**Architects subcontract most.** Architects subcontract more work than any other type of design organization, according to ENR's survey. Two out of three architects say they use outside firms for structural, mechanical and electrical engineering. The arrangement is fairly reciprocal as one out of three consulting engineers report they subcontract to architects. And one out of four of these consulting engineers use

outside firms for some of their mechanical and electrical work.

The use of outside firms diminishes for combined design firms. Only one out of seven architects-engineers subcontract their mechanical and electrical work, and the ratio drops to 1:8 for subcontracted structural work. Engineers-architects employ only a minimal number of outside firms.

**About the report.** This seventh annual report on The ENR 500 leading design firms ranks respondents according to company-reported 1970 billings for professional services related to construction, including fees, reimbursables, staff

continued **THE ENR 500**

Billings totaled over \$1.3 million up to \$2.49 million

	Type of firm #	Buildings	Heavy const.	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
337. Leonard S. Wegman Co., Inc., New York, N. Y.	E	..	+	+	+	+	+	+	..	..
338. Bartkus & Assoc., Inc., Chicago, Ill.	E	+	+	+	+	+	+	+	+	+
339. Stevens & Wilkinson, Inc., Atlanta, Ga.	AE	+	+	+	+	+	+	+	+	+
340. Farkas, Barron & Partners, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
341. A. W. Martin Assoc., Inc., King of Prussia, Pa.	E	+	+	+	+	+	+	+	+	+
342. Lankton-Ziegele-Terry & Assoc., Inc., Peoria, Ill.	AE	+	+	+	+	+	+	+	+	+
343. Universat Engineering Corp., Boston, Mass.	E	+	+	+	+	+	+	+	+	+
344. Setter, Leach & Lindstrom, Inc., Minneapolis, Minn.	AE	+	+	+	+	+	+	+	+	+
345. Preston M. Geren, Fort Worth, Tex.	AE	+	+	+	+	+	+	+	+	+
346. Allen & Hoshall, Memphis, Tenn.	E	+	+	+	+	+	+	+	+	+
347. Hertzka & Knowles, San Francisco, Calif.	A	+	+	+	+	+	+	+	+	+
348. Schoenteld Assoc., Inc., & Highway Engineers, Inc., Boston, Mass.	EA	+	+	+	+	+	+	+	+	+
349. McNamee, Porter & Seeley, Ann Arbor, Mich.	E	+	+	+	+	+	+	+	+	+
350. William Dorsky & Assoc., Cleveland, Ohio*	A	+	+	+	+	+	+	+	+	+
351. Masiello & Assoc., Palm Beach, Fla.	AE	+	+	+	+	+	+	+	+	+
352. Shreve, Lamb & Harmon Assoc., New York, N. Y.	AP	+	+	+	+	+	+	+	+	+
353. Weiskopf & Pickworth, New York, N. Y.*	E	+	+	+	+	+	+	+	+	+
354. Lozier Engineers, Inc., Rochester, N. Y.	E	+	+	+	+	+	+	+	+	+
355. Hamby, Kennerly, Slomanson & Smith, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
356. Neste, Brudin & Stone, San Bernardino, Calif.	E	+	+	+	+	+	+	+	+	+
357. Barge, Waggoner, Sumner & Cannon, Inc., Nashville, Tenn.	E	+	+	+	+	+	+	+	+	+
358. Kramer, Hirsch & Carchidi, Trenton, N. J.	A	+	+	+	+	+	+	+	+	+
359. Russell Gibson & von Dohler, West Hartford, Conn.	A	+	+	+	+	+	+	+	+	+
360. Dubin, Mindell, Bloome Assoc., West Hartford, Conn.	E	+	+	+	+	+	+	+	+	+
361. Rossi & Nickerson, Inc., Toledo, Ohio.	EA	+	+	+	+	+	+	+	+	+
362. Alonzo B. Reed, Inc., Boston, Mass.	EAP	+	+	+	+	+	+	+	+	+
363. Manganaro, Martin & Lincoln, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
364. Westenhoff & Novick, Inc., Chicago, Ill.	ES	+	+	+	+	+	+	+	+	+
365. Peckham-Guyton Inc., St. Louis, Mo.	AP	+	+	+	+	+	+	+	+	+
366. Yule, Jordan & Assoc., Philadelphia, Pa.	EA	+	+	+	+	+	+	+	+	+
367. Paul Weidinger, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
368. Hammel Green & Abrahamson, Inc., St. Paul, Minn.	AE	+	+	+	+	+	+	+	+	+
369. SMS Architects, Stamford, Conn.	A	+	+	+	+	+	+	+	+	+
370. Hardesty & Hanover, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
371. Andrews & Clark, Inc., New York, N. Y.	E	+	+	+	+	+	+	+	+	+
372. Chas. H. Sells, Inc., Pleasantville, N. Y.	E	+	+	+	+	+	+	+	+	+
373. Nussbaumer & Clarke, Inc., Buffalo, N. Y.	E	+	+	+	+	+	+	+	+	+
374. Alexander Potter Assoc., New York, N. Y.	E	+	+	+	+	+	+	+	+	+
375. Brodsky, Hopf & Adler, New York, N. Y.	AE	+	+	+	+	+	+	+	+	+
376. Kivett & Myers, Kansas City, Mo.	AP	+	+	+	+	+	+	+	+	+
377. Morris Lapidus Assoc., New York, N. Y.	A	+	+	+	+	+	+	+	+	+
378. The Sprink Corp., Sacramento, Calif.	EP	+	+	+	+	+	+	+	+	+
379. Robert Rosenwasser, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
380. Saggus, Vaught, Spiker & Assoc., Atlanta, Ga.	AE	+	+	+	+	+	+	+	+	+
381. Hicks & Ragland, Lubbock, Tex.	E	+	+	+	+	+	+	+	+	+
382. Hewitt & Royer, Kansas City, Mo.	AE	+	+	+	+	+	+	+	+	+
383. Baker-Wibberley & Assoc., Inc., Hagerstown, Md.	E	+	+	+	+	+	+	+	+	+
384. Taliesin Associated Architects, Div. of the Frank Lloyd Wright Foundation, Scottsdale, Ariz.	A	+	+	+	+	+	+	+	+	+
385. Haver, Nunn & Nelson, Phoenix, Ariz.	AE	+	+	+	+	+	+	+	+	+

Billings estimated by ENR, based on company-reported size of staff  
 E = Consulting engineer; AE = Architect-Engineer; EA = Engineer-Architect; S = Soils engineer. Firms classified them-

loans or temporary staff transfers.

Over 3,300 design firms were surveyed and 40% responded. The response by large firms was close to 100% because of numerous follow-ups. Only 12 leading designers were reluctant to give their billings—about half as many as refused in 1969. These firms are included, ranked by ENR estimates of billings based on company-reported staff sizes.

Design-constructors are ranked by contract volume, including design-only contracts valued at estimated erected value of such projects.

Reprints of this article and of ENR's April 8 article on Construction's Top 400 cost 30 cents each. Multiple-copy rates on request. Write Promotion Dept., Engineering News-Record, 330 West 42nd St., New York, N. Y. 10036.

continued

## THE ENR 500

### Billings totaled over \$1.3 million up to \$2.49 million

	Type of firm *	Buildings	Heavy Const.	Architectural	Civil eng.	Structural	Mechanical	Electrical	City plans	Jobs abroad
386. Smith, Korach, Hayet Lippack, Haynie & Assoc., Miami, Fla.	AE	+	+	+	+	+	+	+	+	+
387. Mid-America Engineers, Inc., Chicago, Ill.	EA	+	+	+	+	+	+	+	+	+
388. Lathrop Douglass, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
389. Trygve Hoff & Assoc., Cleveland, Ohio	E	+	+	+	+	+	+	+	+	+
390. Page Southerland & Page, Austin, Tex.	AE	+	+	+	+	+	+	+	+	+
391. Fraioli-Blum-Yesselman, New York, N. Y.	E	+	+	+	+	+	+	+	+	+
392. Lee T. Purcell Assoc., Paterson, N. J.	E	+	+	+	+	+	+	+	+	+
393. Cella Barr Evans & Assoc., Tucson, Ariz.	E	+	+	+	+	+	+	+	+	+
394. Maloney, Herrington, Freesz and Lund, Seattle, Wash.	A	+	+	+	+	+	+	+	+	+
395. H. J. Ross Assoc., Inc., Miami, Fla.	E	+	+	+	+	+	+	+	+	+
396. Capitol Engineering Corp., Dillsburg, Pa.	E	+	+	+	+	+	+	+	+	+
397. Metropolitan Engineers, Seattle, Wash.	E	+	+	+	+	+	+	+	+	+
398. Alonzo J. Harriman Assoc., Inc., Auburn, Me.	AE	+	+	+	+	+	+	+	+	+
399. Kennedy Engineers, San Francisco, Calif.	E	+	+	+	+	+	+	+	+	+
400. Finch, Alexander, Barnes, Rothschild & Paschal, Atlanta, Ga.	AE	+	+	+	+	+	+	+	+	+
401. Carson, Lundin & Shaw, New York, N. Y.	A	+	+	+	+	+	+	+	+	+
402. R. Duell & Assoc., Santa Monica, Calif.	A	+	+	+	+	+	+	+	+	+
403. D'Anastasio, Lisiewski & Tarquini, Camden, N. J.	AEP	+	+	+	+	+	+	+	+	+
404. R. W. Robinson Assoc., South Holland, Ill.	E	+	+	+	+	+	+	+	+	+
405. McCormick, Taylor & Assoc., Inc., Philadelphia, Pa.	ES	+	+	+	+	+	+	+	+	+
406. Sunn, Low Tom & Hara, Inc., Honolulu, Hawaii	E	+	+	+	+	+	+	+	+	+
407. M. A. Nishkian & Co., Long Beach, Calif.	EA	+	+	+	+	+	+	+	+	+
408. Vulcan-Cincinnati, Inc., Cincinnati, Ohio	E	+	+	+	+	+	+	+	+	+
409. Henry B. Steeg & Assoc., Inc., Indianapolis, Ind.	E	+	+	+	+	+	+	+	+	+
410. Morrison-Maierle, Inc., Helena, Mont.	EA	+	+	+	+	+	+	+	+	+
411. Tarapata-MacMahon-Pausen Assoc., Inc., Bloomfield Hills, Mich.	AE	+	+	+	+	+	+	+	+	+
412. Fosa, Engelstad & Foss, Moorhead, Minn.	AE	+	+	+	+	+	+	+	+	+
413. Wade Trim & Assoc., Inc., Taylor, Mich.	E	+	+	+	+	+	+	+	+	+
414. Haley & Aldrich, Inc., Cambridge, Mass.	ES	+	+	+	+	+	+	+	+	+
415. Kelly, Pittelko, Fritz & Forssen, Seattle, Wash.	E	+	+	+	+	+	+	+	+	+
416. Von Storch & Burkavage, Clarks Summit, Pa.	AE	+	+	+	+	+	+	+	+	+
417. Lorenz, Williams, Williams, Lively & Likens, Dayton, Ohio	AE	+	+	+	+	+	+	+	+	+
418. Wm. F. Freeman Assoc., High Point, N. C.	AE	+	+	+	+	+	+	+	+	+
419. Finkbeiner, Pettis & Strout, Ltd., Toledo, Ohio	E	+	+	+	+	+	+	+	+	+
420. Russell & Axon, St. Louis, Mo.	EA	+	+	+	+	+	+	+	+	+
421. Hurst-Rosche Engineers, Inc., Hillsboro, Ill.	E	+	+	+	+	+	+	+	+	+
422. Nolen, Swinburne & Assoc., Philadelphia, Pa.	AE	+	+	+	+	+	+	+	+	+
423. Teetor-Dobbins, Ronkonkoma, N. Y.	E	+	+	+	+	+	+	+	+	+
424. Miller-Warden-Western, Inc., Lincoln, Neb.	ES	+	+	+	+	+	+	+	+	+
425. Jones & Fellers, Augusta, Ga.	AEP	+	+	+	+	+	+	+	+	+
426. Robert Charles Assoc., East Boston, Mass.	AE	+	+	+	+	+	+	+	+	+
427. Walsh-Forkert Civil Engineers, Inc., West Covina, Calif.	E	+	+	+	+	+	+	+	+	+
428. Wolff-Zimmer-Gunsul-Frasca-Ritter, Portland, Ore.	A	+	+	+	+	+	+	+	+	+
429. Malson & Wegleitner Architects, Inc., Minneapolis, Minn.	A	+	+	+	+	+	+	+	+	+
430. John Carollo Engineers, Phoenix, Ariz.	E	+	+	+	+	+	+	+	+	+
431. Greenleaf / Telesca, Miami, Fla.	EA	+	+	+	+	+	+	+	+	+
432. Gwin Engineers, Inc., Altoona, Pa.	E	+	+	+	+	+	+	+	+	+
433. Beiswenger, Hoch & Assoc., North Miami Beach, Fla.	E	+	+	+	+	+	+	+	+	+
434. Edward J. Tedesco Assoc., Inc., Winchester, Mass.	A	+	+	+	+	+	+	+	+	+
435. Kenneth E. Wischmeyer & Partners, St. Louis, Mo.	A	+	+	+	+	+	+	+	+	+
436. Crawford, Murphy & Tilly, Inc., Springfield, Ill.	E	+	+	+	+	+	+	+	+	+
437. Dale Engineering Co., Inc., Utica, N. Y.	EA	+	+	+	+	+	+	+	+	+
438. National Soil Services, Inc., Houston, Tex.	S	+	+	+	+	+	+	+	+	+
439. Myers, Macomber & Faber, Inc., Harrisburg, Pa.	E	+	+	+	+	+	+	+	+	+
440. Homer L. Chastain Assoc., Decatur, Ill.	E	+	+	+	+	+	+	+	+	+
441. American Water Works Service Co., Inc., Philadelphia, Pa.	E	+	+	+	+	+	+	+	+	+
442. Fleck, Burkart, Shropshire, Boals, Reid & Assoc., Inc., Indianapolis, Ind.	AE	+	+	+	+	+	+	+	+	+

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